

Eve O'Sullivan

From: Marian Doyle
Sent: 31 January 2019 13:12
To: Eve O'Sullivan
Subject: P0395-03 Wyeth TA request
Attachments: 18_10250AT01_291118.pdf

From: Edward Porter [mailto:Edward.Porter@awnconsulting.com]
Sent: 30 November 2018 13:12
To: Marian Doyle <M.Doyle2@epa.ie>
Cc: Gerard Kelly <gerard.kelly@environet.ie>; Shiel,Brian,ASKEATON,Nestle Nutrition <Brian.Shiel@wyethnutrition.com>
Subject: Nestle Nutrition Air Response to RFI

Marian,

Please find attached the air quality response to the RFI in relation to the Nestle Nutrition facility in Askeaton, County Limerick.

Kind regards

Dr. Edward Porter

Director (Air Quality) C Chem MRSC MIAQM MIEEnvSc

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TECHNICAL NOTE

Project **Nestle Askeaton**

Subject **Response To RFI**

Author **Dr. Edward Porter**

Date **29/11/18**

Ref. **18/10250AT01**

Attached is a response to the Request For Additional Information from the EPA in relation to Air Dispersion Modelling of Dust emissions.

AWN Consulting were responsible for carrying out the air modelling assessment that was submitted as part of the Technical Amendment Request.

Kind regards



Dr. Edward Porter C CHEM MRSC MIAQM

AWN Consulting

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EPA Request For Additional Information

In relation to the Air Dispersion Modelling, it was requested that updated modelling be submitted to reflect the ratio of PM₁₀ / Total Dust and PM_{2.5} / Total Dust emitted from the licenced emission points.

Response:

Ambient Ground Level Concentrations (GLCs) of PM₁₀ / PM_{2.5} have been predicted below in Tables 2 – 3 for the proposed scenario based, on a conservative basis, on continuous operation of all emission points onsite and with a PM₁₀ / Total Dust ratio of 0.40. Ambient Ground Level Concentrations (GLCs) of PM₁₀ / PM_{2.5} have also been predicted below in Tables 4 – 5 for the proposed scenario based, as a worst-case, on continuous operation of all emission points onsite and with a PM₁₀ / Total Dust ratio of 0.50. Results have also been outlined for the existing scenario (based on licenced emission points A2-1, A2-2, A2-3, A2-4, A2-5 & A2-6) in Tables 6 - 7 based on a ratio for PM₁₀ / Total Dust ratio of 0.40 and in Table 8 - 9 based on a ratio for PM₁₀ / Total Dust ratio of 0.50.

PM₁₀ / PM_{2.5} Emission Monitoring Data

The ratio of PM₁₀ to Total Dust for the facility has been derived using the monitoring data obtained by Air Scientifics on the 4th October 2018. As a worst-case, PM_{2.5} levels are assumed to be equivalent to PM₁₀ levels in the model. The results of the survey are outlined in Appendix 1 for A2-4 and A2-6 with the results and derived ratios outlined in Table 1.

Monitoring Scenario	Total Dust	PM ₁₀	PM _{2.5}	PM ₁₀ / Total Dust Ratio	PM _{2.5} / Total Dust Ratio
A2-4 Run 1	18.6	4.9	0.4	0.26	0.02
A2-4 Run 2	24.5	3.6	0.5	0.15	0.02
A2-6 Run 1	26.8	9.26	0.4	0.35	0.01
A2-6 Run 2	30.5	9.1	12.3	0.30	0.40
Average	25.1	6.7	3.4	0.27	0.14

Table 1 PM₁₀ And PM_{2.5} Ratios Derived From Air Scientific Monitoring On A2-4 & A2-6 (Date 04/10/18)

As shown in Table 1, the average PM₁₀ / Total Dust ratio is 0.27 whilst the average PM_{2.5} / Total Dust ratio is 0.14. In order to ensure a conservative approach, the modelling has been undertaken using a PM₁₀ / Total Dust ratio of 0.40 with the same ratio (0.40) also applied to the PM_{2.5} / Total Dust ratio in Tables 2 and 3.

An even more conservative approach is adopted in Tables 4 & 5 with a PM₁₀ / Total Dust ratio of 0.50 being used with the same ratio (0.50) also applied to the PM_{2.5} / Total Dust ratio.

Proposed Scenario: PM₁₀ / Total Dust Ratio Of 0.40

The results for the proposed scenario, based on a PM₁₀ / Total Dust ratio of 0.40, indicate that the ambient ground level concentration is below the relevant air quality

standard for PM₁₀ / PM_{2.5}. Emissions from the facility lead to an ambient PM₁₀ concentration (including background) which is 52% of the maximum ambient 24-hour limit value at the worst-case receptor (see Table 2). In relation to the annual mean concentration, ambient PM₁₀ concentration (including background) is at most 36% of the annual mean limit value at the worst-case receptor whilst the annual ambient PM_{2.5} concentration (including background) is at most 46% of the annual mean limit value at the worst-case receptor (Tables 2 and 3).

Pollutant / Year	Background (µg/m ³)	Averaging Period ^{Note 2}	Process Contribution (µg/m ³)	Predicted Environmental Concentration (µg/Nm ³)	Standard (µg/Nm ³) ^{Note 1}
PM ₁₀ / 2012	18.0	Maximum 24-hr mean (as a 90 th ile)	15.9	24.9	50
PM ₁₀ / 2012	9.2	Annual mean	5.4	14.4	40
PM ₁₀ / 2013	18.0	Maximum 24-hr mean (as a 90 th ile)	17.0	26.0	50
PM ₁₀ / 2013	9.2	Annual mean	5.1	14.1	40
PM ₁₀ / 2014	18.0	Maximum 24-hr mean (as a 90 th ile)	14.6	23.6	50
PM ₁₀ / 2014	9.2	Annual mean	5.2	14.2	40
PM ₁₀ / 2015	18.0	Maximum 24-hr mean (as a 90 th ile)	15.5	24.5	50
PM ₁₀ / 2015	9.2	Annual mean	5.3	14.3	40
PM ₁₀ / 2016	18.0	Maximum 24-hr mean (as a 90 th ile)	14.0	23.0	50
PM ₁₀ / 2016	9.2	Annual mean	4.9	13.9	40

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC)

Note 2 Short-term Environmental Concentrations calculated according to UK DEFRA guidance⁽¹⁾ based on the maximum background 24-hr mean (as a 90thile) of 18.0 µg/m³ (based on Kilkitt)

Table 2 Dispersion Model Results For The Proposed Scenario – PM₁₀ (PM₁₀ / Total Dust Ratio = 0.4)

¹ EPA (2010) Air Dispersion Modelling From Industrial Installations Guidance Note

Pollutant / Year	Annual Mean Background ($\mu\text{g}/\text{m}^3$)	Averaging Period	Process Contribution ($\mu\text{g}/\text{m}^3$)	Predicted Environmental Concentration ($\mu\text{g}/\text{Nm}^3$)	Standard ($\mu\text{g}/\text{Nm}^3$) ^{Note 1}
PM_{2.5} / 2012	6.0	Annual mean	5.4	11.4	25
PM_{2.5} / 2013	6.0	Annual mean	5.1	11.1	25
PM_{2.5} / 2014	6.0	Annual mean	5.2	11.2	25
PM_{2.5} / 2015	6.0	Annual mean	5.3	11.3	25
PM_{2.5} / 2016	6.0	Annual mean	4.9	10.9	25

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC)

Table 3 Dispersion Model Results For The Proposed Scenario – PM_{2.5} (PM₁₀ / Total Dust Ratio = 0.4)

PM₁₀ / Total Dust Ratio Of 0.50

The results for the proposed scenario, based on a PM₁₀ / Total Dust ratio of 0.50, indicate that the ambient ground level concentration is below the relevant air quality standard for PM₁₀ / PM_{2.5}. Emissions from the facility lead to an ambient PM₁₀ concentration (including background) which is 61% of the maximum ambient 24-hour limit value at the worst-case receptor (see Table 4). In relation to the annual mean concentration, ambient PM₁₀ concentration (including background) is at most 40% of the annual mean limit value at the worst-case receptor whilst the annual ambient PM_{2.5} concentration (including background) is at most 51% of the annual mean limit value at the worst-case receptor (Tables 4 and 5).

Pollutant / Year	Background ($\mu\text{g}/\text{m}^3$)	Averaging Period ^{Note 2}	Process Contribution ($\mu\text{g}/\text{m}^3$)	Predicted Environmental Concentration ($\mu\text{g}/\text{Nm}^3$)	Standard ($\mu\text{g}/\text{Nm}^3$) ^{Note 1}
PM ₁₀ / 2012	18.0	Maximum 24-hr mean (as a 90 th ile)	19.9	28.9	50
PM ₁₀ / 2012	9.2	Annual mean	6.8	15.8	40
PM ₁₀ / 2013	18.0	Maximum 24-hr mean (as a 90 th ile)	21.3	30.3	50
PM ₁₀ / 2013	9.2	Annual mean	6.4	15.4	40
PM ₁₀ / 2014	18.0	Maximum 24-hr mean (as a 90 th ile)	18.3	27.3	50
PM ₁₀ / 2014	9.2	Annual mean	6.5	15.5	40
PM ₁₀ / 2015	18.0	Maximum 24-hr mean (as a 90 th ile)	19.4	28.4	50
PM ₁₀ / 2015	9.2	Annual mean	6.6	15.6	40
PM ₁₀ / 2016	18.0	Maximum 24-hr mean (as a 90 th ile)	17.5	26.5	50
PM ₁₀ / 2016	9.2	Annual mean	6.1	15.1	40

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC)

Note 2 Short-term Environmental Concentrations calculated according to UK DEFRA guidance⁽²⁾ based on the maximum background 24-hr mean (as a 90thile) of 18.0 $\mu\text{g}/\text{m}^3$ (based on Kilkitt)

Table 4 Dispersion Model Results For The Proposed Scenario – PM₁₀ (PM₁₀ / Total Dust Ratio = 0.5)

Pollutant / Year	Annual Mean Background ($\mu\text{g}/\text{m}^3$)	Averaging Period	Process Contribution ($\mu\text{g}/\text{m}^3$)	Predicted Environmental Concentration ($\mu\text{g}/\text{Nm}^3$)	Standard ($\mu\text{g}/\text{Nm}^3$) ^{Note 1}
PM _{2.5} / 2012	6.0	Annual mean	6.8	12.8	25
PM _{2.5} / 2013	6.0	Annual mean	6.4	12.4	25
PM _{2.5} / 2014	6.0	Annual mean	6.5	12.5	25
PM _{2.5} / 2015	6.0	Annual mean	6.6	12.6	25
PM _{2.5} / 2016	6.0	Annual mean	6.1	12.1	25

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC)

Table 5 Dispersion Model Results For The Proposed Scenario – PM_{2.5} (PM₁₀ / Total Dust Ratio = 0.5)

² EPA (2010) Air Dispersion Modelling From Industrial Installations Guidance Note

Existing Scenario: PM₁₀ / Total Dust Ratio Of 0.40

The results for the existing scenario, based on a PM₁₀ / Total Dust ratio of 0.40, indicate that the ambient ground level concentration is below the relevant air quality standard for PM₁₀ / PM_{2.5}. Emissions from the facility lead to an ambient PM₁₀ concentration (including background) which is 57% of the maximum ambient 24-hour limit value at the worst-case receptor (see Table 6). In relation to the annual mean concentration, ambient PM₁₀ concentration (including background) is at most 39% of the annual mean limit value at the worst-case receptor whilst the annual ambient PM_{2.5} concentration (including background) is at most 49% of the annual mean limit value at the worst-case receptor (Tables 6 and 7).

Pollutant / Year	Background (µg/m ³)	Averaging Period ^{Note 2}	Process Contribution (µg/m ³)	Predicted Environmental Concentration (µg/Nm ³)	Standard (µg/Nm ³) ^{Note 1}
PM ₁₀ / 2012	18.0	Maximum 24-hr mean (as a 90 th ile)	17.3	26.5	50
PM ₁₀ / 2012	9.2	Annual mean	6.2	15.4	40
PM ₁₀ / 2013	18.0	Maximum 24-hr mean (as a 90 th ile)	19.2	28.4	50
PM ₁₀ / 2013	9.2	Annual mean	6.0	15.2	40
PM ₁₀ / 2014	18.0	Maximum 24-hr mean (as a 90 th ile)	16.9	26.1	50
PM ₁₀ / 2014	9.2	Annual mean	6.2	15.4	40
PM ₁₀ / 2015	18.0	Maximum 24-hr mean (as a 90 th ile)	17.6	26.8	50
PM ₁₀ / 2015	9.2	Annual mean	6.2	15.4	40
PM ₁₀ / 2016	18.0	Maximum 24-hr mean (as a 90 th ile)	16.3	25.5	50
PM ₁₀ / 2016	9.2	Annual mean	5.9	15.1	40

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC)

Note 2 Short-term Environmental Concentrations calculated according to UK DEFRA guidance⁽³⁾ based on the maximum background 24-hr mean (as a 90thile) of 18.0 µg/m³ (based on Kilkitt)

Table 6 Dispersion Model Results For The Existing Scenario – PM₁₀ (PM₁₀ / Total Dust Ratio = 0.4)

³ EPA (2010) Air Dispersion Modelling From Industrial Installations Guidance Note

Pollutant / Year	Annual Mean Background ($\mu\text{g}/\text{m}^3$)	Averaging Period	Process Contribution ($\mu\text{g}/\text{m}^3$)	Predicted Environmental Concentration ($\mu\text{g}/\text{Nm}^3$)	Standard ($\mu\text{g}/\text{Nm}^3$) ^{Note 1}
PM_{2.5} / 2012	6.0	Annual mean	6.2	12.2	25
PM_{2.5} / 2013	6.0	Annual mean	6.0	12.0	25
PM_{2.5} / 2014	6.0	Annual mean	6.2	12.2	25
PM_{2.5} / 2015	6.0	Annual mean	6.2	12.2	25
PM_{2.5} / 2016	6.0	Annual mean	5.9	11.9	25

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC)

Table 7 Dispersion Model Results For The Existing Scenario – PM_{2.5} (PM₁₀ / Total Dust Ratio = 0.4)

PM₁₀ / Total Dust Ratio Of 0.50

The results for the existing scenario, based on a PM₁₀ / Total Dust ratio of 0.50, indicate that the ambient ground level concentration is below the relevant air quality standard for PM₁₀ / PM_{2.5}. Emissions from the facility lead to an ambient PM₁₀ concentration (including background) which is 66% of the maximum ambient 24-hour limit value at the worst-case receptor (see Table 8). In relation to the annual mean concentration, ambient PM₁₀ concentration (including background) is at most 43% of the annual mean limit value at the worst-case receptor whilst the annual ambient PM_{2.5} concentration (including background) is at most 55% of the annual mean limit value at the worst-case receptor (Tables 8 and 9).

Pollutant / Year	Background ($\mu\text{g}/\text{m}^3$)	Averaging Period ^{Note 2}	Process Contribution ($\mu\text{g}/\text{m}^3$)	Predicted Environmental Concentration ($\mu\text{g}/\text{Nm}^3$)	Standard ($\mu\text{g}/\text{Nm}^3$) ^{Note 1}
PM ₁₀ / 2012	18.0	Maximum 24-hr mean (as a 90 th ile)	21.7	30.9	50
PM ₁₀ / 2012	9.2	Annual mean	7.8	17.0	40
PM ₁₀ / 2013	18.0	Maximum 24-hr mean (as a 90 th ile)	23.9	33.1	50
PM ₁₀ / 2013	9.2	Annual mean	7.5	16.7	40
PM ₁₀ / 2014	18.0	Maximum 24-hr mean (as a 90 th ile)	21.2	30.4	50
PM ₁₀ / 2014	9.2	Annual mean	7.8	17.0	40
PM ₁₀ / 2015	18.0	Maximum 24-hr mean (as a 90 th ile)	22.1	31.3	50
PM ₁₀ / 2015	9.2	Annual mean	7.8	17.0	40
PM ₁₀ / 2016	18.0	Maximum 24-hr mean (as a 90 th ile)	20.3	29.5	50
PM ₁₀ / 2016	9.2	Annual mean	7.5	16.7	40

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC)

Note 2 Short-term Environmental Concentrations calculated according to UK DEFRA guidance⁽⁴⁾ based on the maximum background 24-hr mean (as a 90thile) of 18.0 $\mu\text{g}/\text{m}^3$ (based on Kilkitt)

Table 8 Dispersion Model Results For The Existing Scenario – PM₁₀ (PM₁₀ / Total Dust Ratio = 0.5)

Pollutant / Year	Annual Mean Background ($\mu\text{g}/\text{m}^3$)	Averaging Period	Process Contribution ($\mu\text{g}/\text{m}^3$)	Predicted Environmental Concentration ($\mu\text{g}/\text{Nm}^3$)	Standard ($\mu\text{g}/\text{Nm}^3$) ^{Note 1}
PM _{2.5} / 2012	6.0	Annual mean	7.8	13.8	25
PM _{2.5} / 2013	6.0	Annual mean	7.5	13.5	25
PM _{2.5} / 2014	6.0	Annual mean	7.8	13.8	25
PM _{2.5} / 2015	6.0	Annual mean	7.8	13.8	25
PM _{2.5} / 2016	6.0	Annual mean	7.5	13.5	25

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC)

Table 9 Dispersion Model Results For The Existing Scenario – PM_{2.5} (PM₁₀ / Total Dust Ratio = 0.5)

⁴ EPA (2010) Air Dispersion Modelling From Industrial Installations Guidance Note

Summary

The assessment has confirmed that existing emissions of PM₁₀ / PM_{2.5} emissions from the facility are in compliance with the ambient air quality standards at all times whilst the proposed scenario will continue to be in compliance with these same limit values. Moreover, the proposed scenario will lower the ambient impact of the facility by between 3% - 5% of the ambient air quality standards.

The approach to the assessment was conservative and based on the following assumptions as a worst-case:

- Worst-case ratios for the PM₁₀ / Total Dust ratio of 0.40 and 0.50 were applied to the assessment.
- Similarly, worst-case ratios for the PM_{2.5} / Total Dust ratio of 0.40 and 0.50 were applied to the assessment.
- All emission points were assumed to be in operation for 24 hours per days, 365 days per year.
- All emission points were assumed to be operating at their maximum volume flow for the full year.
- All emission points were assumed to be emitting at their maximum licenced Total Dust emission concentration for the full year.

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Appendix 1 – Summary of Air Scientific Air Monitoring Report (Survey Date 04/10/18)

Document No: WYNUTL10041018
 Visit No: 18
 Year: 2018
 Office: Limerick

Licence Number:P0395-03
 Licence Holder:Wyeth Nutritionals
 Facility Location: Askeaton, Co. Limerick
 Version No: 1

1.4 Summary of Results

Emission Point Number: A2-4 Run 1

Parameter	Method	Units	Result	MU +/-	Limit	O ₂ Ref. (%)	Moisture Ref.(%)	Compliant	Blanks	Date	Time on	Time off	Accreditation	
													Sampling	Analysis
PM ₁₀	EN 23210	mg.m ⁻³	4.9	0.64	-	-	-	-	-	04/10/2018	11:22	11:52	No	No
PM _{2.5}	EN 23210	mg.m ⁻³	0.4	0.05	-	-	-	-	-	04/10/2018	11:22	11:52	No	No
Total Dust Collected	-	mg.m ⁻³	18.6	-	-	-	-	-	-	04/10/2018	11:22	11:52	No	No

Note 1: All results are normalised to standard temperature and pressure (0°C and 101.3kPa)
 Note 2: All results are reported in the format as defined by the EPA in guidance note AG2:2017.

Emission Point Number: A2-4 Run 2

Parameter	Method	Units	Result	MU +/-	Limit	O ₂ Ref. (%)	Moisture Ref.(%)	Compliant	Blanks	Date	Time on	Time off	Accreditation	
													Sampling	Analysis
PM ₁₀	EN 23210	mg.m ⁻³	3.6	0.59	-	-	-	-	-	04/10/2018	12:18	11:52	No	No
PM _{2.5}	EN 23210	mg.m ⁻³	0.5	0.09	-	-	-	-	-	04/10/2018	12:18	11:52	No	No
Total Dust Collected	-	mg.m ⁻³	24.5	-	-	-	-	-	-	04/10/2018	12:18	11:52	No	No

Note 1: All results are normalised to standard temperature and pressure (0°C and 101.3kPa)
 Note 2: All results are reported in the format as defined by the EPA in guidance note AG2:2017.

Document No: WYNU TL10041018
 Visit No: 18
 Year: 2018
 Office: Limerick

Licence Number: P0395-03
 Licence Holder: Wyeth Nutritionals
 Facility Location: Askeaton, Co. Limerick
 Version No: 1

Emission Point Number: A2-6 Run 1

Parameter	Method	Units	Result	MU +/-	Limit	O ₂ Ref. (%)	Moisture Ref. (%)	Compliant	Blanks	Date	Time on	Time off	Accreditation	
													Sampling	Analysis
PM ₁₀	EN 23210	mg.m ⁻³	9.26	0.76	-	-	-	-	-	04/10/2018	13:41	14:11	No	No
PM _{2.5}	EN 23210	mg.m ⁻³	0.4	0.04	-	-	-	-	-	04/10/2018	13:41	14:11	No	No
Total Dust Collected	-	mg.m ⁻³	26.8	-	-	-	-	-	-	04/10/2018	13:41	14:11	No	No

Note 1: All results are normalised to standard temperature and pressure (0°C and 101.3kPa)
 Note 2: All results are reported in the format as defined by the EPA in guidance note AG2:2017.

Emission Point Number: A2-6 Run 2

Parameter	Method	Units	Result	MU +/-	Limit	O ₂ Ref. (%)	Moisture Ref. (%)	Compliant	Blanks	Date	Time on	Time off	Accreditation	
													Sampling	Analysis
PM ₁₀	EN 23210	mg.m ⁻³	9.1	0.55	-	-	-	-	-	04/10/2018	14:30	15:00	No	No
PM _{2.5}	EN 23210	mg.m ⁻³	12.3	0.74	-	-	-	-	-	04/10/2018	14:30	15:00	No	No
Total Dust Collected	-	mg.m ⁻³	30.5	-	-	-	-	-	-	04/10/2018	14:30	15:00	No	No

Note 1: All results are normalised to standard temperature and pressure (0°C and 101.3kPa)
 Note 2: All results are reported in the format as defined by the EPA in guidance note AG2:2017.